

What is claimed is:

1                   1. A method of detecting the falsification of contents of a plurality of  
2 files stored on a computer medium, comprising:  
3                   producing first falsification-detecting information corresponding to current  
4 filenames or current contents of the plurality of files; and  
5                   detecting the falsification of the contents of the plurality of files by  
6 comparing second falsification-detecting information corresponding to the filenames or  
7 contents of the plurality of files at the time of registration or renewal with the first  
8 falsification-detecting information.

1                   2. The method of claim 1 wherein said first falsification-detecting  
2 information comprises a hash value.

1                   3. A detector for detecting the falsification of contents of a plurality  
2 of files stored on a computer, comprising:  
3                   a falsification-detecting-information producing/processing unit to produce  
4 first falsification-detecting information corresponding to current filenames or current  
5 contents of the plurality of files; and  
6                   a falsification-detection processing unit to compare second falsification-  
7 detecting information corresponding to the filenames or contents of the plurality of files  
8 at the time of their registration or renewal and the first falsification-detecting information,  
9 thereby detecting any falsification in the contents.

1                   4. The detector of claim 3 wherein said first falsification-detecting  
2 information comprises a hash value.

1                   5. A system for detecting the falsification of contents of a plurality of  
2 files stored on a computer, comprising:  
3                   a falsification production means for producing first falsification-detecting  
4 information corresponding to current filenames or current contents of the plurality of  
5 files; and  
6                   a falsification-detection means for comparing second falsification-  
7 detecting information corresponding to the filenames or contents of the plurality of files

8 at the time of their registration or renewal with the first falsification-detecting  
9 information, thereby detecting any falsification in the contents.

1 6. A method using a computer for checking the validity of a plurality  
2 of related files, comprising:

3 producing a first cumulative hash value at a first time comprising a  
4 plurality of first hash values, wherein a first hash value of the plurality of first hash values  
5 is associated with a related file of said plurality of related files; and

6 comparing said first cumulative hash value with a second cumulative hash  
7 value produced at a second time, said second cumulative hash value comprising a  
8 plurality of second hash values, wherein a second hash value of the plurality of second  
9 hash values is associated with the related file of said plurality of related files.

1 7. The method of claim 6 wherein said first hash value comprises  
2 hashing a contents of the related file.

1 8. The method of claim 6 wherein said first hash value comprises  
2 hashing a filename, comprising a path name, of the related file.

1 9. The method of claim 6 wherein the plurality of related files  
2 correspond to a plurality of Web pages.

1 10. The method of claim 6 wherein the first cumulative hash value is a  
2 concatenation of the plurality of first hash values.

1 11. The method of claim 6 wherein the first cumulative hash value is a  
2 hash of a concatenation of the plurality of first hash values.

1 12. A system for checking the validity of a plurality of related files,  
2 comprising:

3 a falsification producing module for producing a first cumulative hash  
4 value at a first time comprising a plurality of first hash values, wherein a first hash value  
5 of the plurality of first hash values is associated with a related file of said plurality of  
6 related files; and

7 a falsification detection module for comparing said first cumulative hash  
8 value with a second cumulative hash value produced at a second time, said second

9 cumulative hash value comprising a plurality of second hash values, wherein a second  
10 hash value of the plurality of second hash values is associated with the related file of said  
11 plurality of related files.

1 13. A system for checking the validity of a plurality of related files,  
2 comprising:

3 a means for producing a first cumulative hash value at a first time  
4 comprising a plurality of first hash values, wherein a first hash value of the plurality of  
5 first hash values is associated with a related file of said plurality of related files; and  
6 a means for comparing said first cumulative hash value with a second  
7 cumulative hash value produced at a second time, said second cumulative hash value  
8 comprising a plurality of second hash values, wherein a second hash value of the plurality  
9 of second hash values is associated with the related file of said plurality of related files.

1 14. A method for embedding security information in a plurality of  
2 files, wherein said plurality of files are related, said method comprising:

3 determining a first set comprising a first plurality of first cryptographic  
4 values, wherein a first cryptographic value of said first set is generated using first  
5 information including contents of a file of said plurality of files;

6 determining a hashed first set by hashing said plurality of first  
7 cryptographic values in said first set; and

8 generating an internet mark comprising said hashed first set, said internet  
9 mark associated with at least one file of said plurality of files.

1 15. The method of claim 14 wherein said plurality of files are  
2 organized hierarchically.

1 16. The method of claim 15 wherein at least one file of said plurality of  
2 files is an HTML file.

1 17. The method of claim 14 wherein said internet mark is selected  
2 from a group consisting of an image, a moving picture, or an audio file.

1 18. The method of claim 17 wherein said image comprises a visual  
2 mark.

1                   19.     The method of claim 14 further comprising:  
2                   determining a second set comprising a second plurality of second  
3                   cryptographic values, wherein a second cryptographic value of said second set is  
4                   generated using second information including a filename of said file of said plurality of  
5                   files; and

6                   wherein generating said internet mark further comprises said second set.

1                   20.     The method of claim 19 wherein said determining said second set  
2                   uses a sorted list of filenames.

1                   21.     A system for embedding security information in a plurality of files,  
2                   wherein said plurality of files are related, said system comprising:  
3                   a falsification-detecting producing module for producing a hashed first set  
4                   by hashing a plurality of first cryptographic values in a first set, wherein a first  
5                   cryptographic value of said first set is generated using first information including a  
6                   contents of a file of said plurality of files; and

7                   an Internet Mark producing module for producing an Internet Mark  
8                   associated with at least one file of said plurality of files, wherein said hashed first set is  
9                   embedded in said Internet Mark.

1                   22.     The system of claim 21 wherein:  
2                   said falsification-detecting producing module further determines a second  
3                   set comprising a second plurality of second cryptographic values, wherein a second  
4                   cryptographic value of said second set is generated using second information including a  
5                   filename of said file of said plurality of files; and  
6                   said Internet Mark producing module further embeds said second set in  
7                   said Internet Mark.

1                   23.     A system for embedding security information in a plurality of files,  
2                   wherein said plurality of files are related, said system comprising:  
3                   means for determining a first set comprising a first plurality of first  
4                   cryptographic values, wherein a first cryptographic value of said first set is generated  
5                   using first information including a contents of a file of said plurality of files;

6 means for determining a hashed first set by hashing said plurality of first  
7 cryptographic values in said first set;

8 means for determining a second set comprising a second plurality of  
9 second cryptographic values, wherein a second cryptographic value of said second set is  
10 generated using second information including a filename of said file of said plurality of  
11 files; and

12 means for generating a digital watermark using said hashed first set, said  
13 second set and an internet mark, said internet mark associated with at least one file of said  
14 plurality of files.

1 24. A method for detecting tampering in at least one file of a plurality  
2 of files associated with a home page, wherein each file of said plurality of files has a  
3 corresponding filename and file contents, said method comprising:

4 generating a first hash value for each filename, wherein each filename  
5 includes a corresponding directory path;

6 forming at a current time a current filename hash value by concatenating  
7 first hash values;

8 generating a second hash value for each file contents; and

9 forming at said current time a current contents hash value by hashing a  
10 result, said result generated by concatenating second hash values.

1 25. The method of claim 24 further comprising:

2 determining tampering of any filenames of said plurality of files at said  
3 current time by comparing said current filename hash value with a previous filename hash  
4 value, said previous filename hash value generated at said previous time.

1 26. The method of claim 25 further comprising:

2 when said determining tampering of any filenames indicates no tampering  
3 of filenames, determining tampering of any contents of said plurality of files at said  
4 current time by comparing said current contents hash value with a previous contents hash  
5 value, said previous contents hash value generated at a previous time.

1 27. The method of claim 24 wherein said concatenating first hash  
2 values is performed after said first hash values are sorted.

1                   28. An intermediary device for determining a location of a falsification  
2 of contents of a document, wherein said document is sent from a server to a client through  
3 said intermediary device in response to a request by said client, and wherein said  
4 document includes an Internet Mark (IM) with embedded falsification information, said  
5 intermediary device comprising:

6                   a falsification detection module for detecting by using said IM, if said  
7 contents has been falsified; and

8                   a notification module for notifying said server and said client of said  
9 location when said falsification detection module indicates said contents has been  
10 falsified, wherein said location includes a route between said server and said intermediary  
11 device.

1                   29. The intermediary device of claim 28 further comprising an Internet  
2 Mark checking module for determining if said Internet Mark was removed from said  
3 document.

1                   30. The intermediary device of claim 28, wherein said falsification  
2 information includes a hash value.

1                   31. A client system for determining a location of a falsification of  
2 contents of a document, wherein said document is sent from a server to an exit gate to  
3 said client system responsive to a client system request, and wherein said contents  
4 includes an Internet Mark (IM) with embedded falsification information, said client  
5 system comprising:

6                   a falsification detection module for detecting by using said IM, if said  
7 contents has been falsified; and

8                   a display for displaying said location when said falsification detection  
9 module indicates said contents has been falsified, wherein said location includes a route  
10 between said exit gate and said client.

1                   32. The client system of claim 31 further comprising an Internet Mark  
2 checking module for determining if said Internet Mark was removed from said document.

1                   33. A method for determining a location of falsification of contents of  
2 a document sent from a server to a client over a communications path, said

3     communications path comprising a first path from said server to an intermediate computer  
4     and a second path from said intermediate computer to said client, wherein said contents  
5     comprises an Internet Mark with embedded cryptographic information, said method  
6     comprising:

7                     sending said document by said server to said intermediate computer over  
8     said first path, when said server validates said contents using said embedded  
9     cryptographic information;

10                    determining said location comprises said first path, if said intermediate  
11    computer detects said contents has been falsified;

12                    sending said document by said intermediate computer to said client over  
13    said second path, when said intermediate computer validates said contents using said  
14    embedded cryptographic information; and

15                    determining said location comprises said second path, if said client detects  
16    said contents has been falsified.

1                    34.    The method of claim 33 wherein said document is a HTML  
2    document.

1                    35.    A system for determining a location of falsification of contents of a  
2    file sent over a communications path, wherein said contents comprises an Internet Mark  
3    with embedded cryptographic information, and wherein said communications path  
4    comprises a first path coupled with a second path, said system comprising:

5                    a server for sending said file over said first path, when said server validates  
6    said contents using said embedded cryptographic information;

7                    an intermediate computer coupled with said server using said first path,  
8    said intermediate computer for determining said location comprises said first path, if said  
9    intermediate computer detects said contents has been falsified, and for sending said file  
10   over said second path, when said intermediate computer validates said contents using said  
11   embedded cryptographic information; and

12                   a client coupled with said intermediate computer using said second path,  
13    said client for determining said location comprises said second path, if said client detects  
14   said contents has been falsified.